Wellness Notes

Parkinson's Disease*

(Part II)

What Causes Parkinson's Disease?

Parkinson's disease occurs when nerve cells, or neurons, in an area of the brain that controls movement die or become impaired. Normally, these neurons produce an important brain chemical known as *dopamine*, but when the neurons die or become impaired, they produce less dopamine. This shortage of dopamine causes the movement problems of people with Parkinson's.

Dopamine is a chemical messenger, or *neurotransmitter*. Dopamine is responsible for transmitting signals between the substantia nigra and multiple brain regions. The connection between the substantia nigra and the *corpus striatum* is critical to produce smooth, purposeful movement. Loss of dopamine in this circuit results in abnormal nerve-firing patterns within the brain that cause impaired movement.

People with Parkinson's also have loss of the nerve endings that produce the neurotransmitter *norepinephrine*. Norepinephrine, which is closely related to dopamine, is the main chemical messenger of the sympathetic nervous system. The sympathetic nervous system controls many automatic functions of the body, such as heart rate and blood pressure. The loss of norepinephrine might help explain several of the non-movement features of Parkinson's, such as fatigue, irregular blood pressure, decreased gastric motility or movement of food through the digestive tract, and postural hypotension. Postural hypotension is a sudden drop in blood pressure when a person stands up from a sitting or lying-down position. It may cause dizziness, lightheadedness, and in some cases, loss of balance or fainting.

Although some cases of Parkinson's appear to be hereditary, and a few can be traced to specific genetic mutations, most cases are sporadic. Sporadic means the disease occurs randomly and does not seem to run in families. Many researchers now believe that

Although researchers increasingly recognize the importance of genetics in Parkinson's disease, most believe environmental exposures increase a person's risk of developing the disease. Even in inherited cases, exposure to toxins or other environmental factors may influence when symptoms of the disease appear or how the disease progresses.

Researchers are continuing to study the normal functions and interactions of these genes in order to find clues about how Parkinson's develops. They also have identified a number of other genes and chromosome regions that may play a role in Parkinson's, but the nature of these links is not yet clear. Whole genome wide association studies, or GWAS, of thousands of people with Parkinson's disease are now underway to find gene variants that allow for an increased risk of developing Parkinson's but are not necessarily causes of this disorder by themselves.